CLAIMS

1. Functionalised materials comprising organic phosphorous-containing groups bonded via oxygen atoms to a mineral oxide of at least one element M, said materials being characterized in that they are essentially amorphous, in that they comprise an essentially monomolecular layer of organic groups bonded to said mineral oxide via an oxygen atom of said oxide to the phosphorous atom, and in that said materials are essentially free of phosphate, phosphonate or phosphinate phases of said element M.

2. Functionalised materials according to claim 1 comprising, distanced from the phosphorous atom, a sulphur-containing group or a reactive group that can be transformed into a sulphur-containing group, said materials being essentially free of sulphate phase of said element M.

3. Functionalised materials according to claim 2, in which the organic sulphur-containing group is selected from the group formed by thiols and derivatives thereof, and sulphonic acid groups and derivatives thereof.

4. Materials according to claim 2 or claim 3, in which the organic sulphur-containing group is selected from the group formed by the thiol group with formula –SH, the sulphide group with formula –S-R1 in which R1 is a hydrocarbon residue, and the polysulphide group with formula $-(S)_y$-R1, in which y is a number equal to 2 or more and R1 is a hydrocarbon residue.

5. Materials according to claim 2 or claim 3, in which the organic sulphur-containing group is selected from the group formed by the sulphonic acid group with formula $-SO_3H$, organic sulphonate groups with formulae $-SO_3R1$ in which R1 is a hydrocarbon residue, and mineral sulphonate groups with formulae $-SO_3(M')_{1/t}$ in which M' is an element with valency t from the periodic table, preferably an alkali metal.

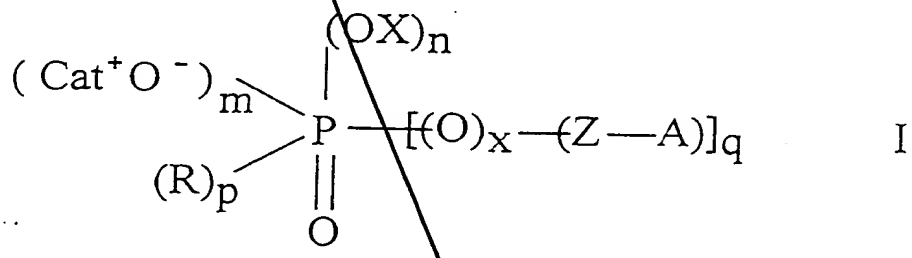
6. Materials according to any one of claims 2 to 5, in which the hydrocarbon chain bonding the phosphorous-containing group to the sulphur-containing group contains 1 to 24 carbon atoms, preferably 2 to 12 carbon atoms.

7. Materials according to any one of claims 2 to 6, in which the hydrocarbon chain bonding the phosphorous-containing group to the sulphur-containing group is an aromatic chain or an aliphatic chain, preferably a saturated aliphatic chain.

8. Materials according to any one of claims 1 to 7, in which M designates an element from groups IB, IIB, IIIB, IVB, VB, VIB, VIIB, VIII, IIIA, IVA, the lanthanides or the actinides of the periodic table.

9. Materials according to any one of claims 1 to 8, in which M is selected from the group formed by titanium, zirconium, iron, aluminium, silicon and tin, and preferably from elements selected from the group formed by titanium, zirconium and aluminium.

10. A process for preparing a functionalised material according to any one of claims 1 to 9, in which a suspension in a liquid of at least one mineral oxide of an element M is brought into contact with at least one solution in a solvent of at least one phosphorous-containing compound with formula I:



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in which the sum m+n+p+q is equal to 3, m=0, 1 or 2, q=0, 1 or 2, x=0 or 1, p=0, 1 or 2, R is a hydrocarbon group, X is a hydrogen atom, a hydrocarbon group or a group with formula

$SiR"_3$ in which R" is a hydrocarbon group, Z is a hydrocarbon group optionally containing heteroatoms, Cat^+ is a monovalent cation and A is a sulphur-containing group or a reactive group that can be transformed into a sulphur-containing group, said contact being made under conditions of pressure, temperature and acidity of the medium such that practically no phosphate, phosphonate, phosphinate or sulphate phase of said element M is formed.

11. A process according to claim 10, in which a suspension in a liquid of at least one mineral oxide of element M is brought into contact with a solution in a solvent of a phosphorous-containing compound with formula I in which Cat^+ is a proton H^+, R is an alkyl group containing 1 to 18 carbon atoms or an aryl group containing 6 to 18 carbon atoms or an alkylaryl group containing 7 to 24 carbon atoms, X is selected from the group formed by alkyl groups containing 1 to 18 carbon atoms, aryl groups containing 6 to 18 carbon atoms, alkylaryl groups containing 7 to 24 carbon atoms and groups with formula $SiR"_3$ in which R" is a hydrocarbon group, Z is a saturated or unsaturated divalent alkyl group containing 1 to 18 carbon atoms or a divalent aryl group containing 6 to 18 carbon atoms or a divalent alkylaryl or arylalkyl group containing 7 to 24 carbon atoms, and A is a sulphur-containing group selected from thiols and derivatives thereof and sulphonic acid groups and derivatives thereof.

12. A process according to claim 10 or claim 11, in which the phosphorous-containing compound with formula I is a compound in which Z is a saturated divalent alkyl group containing 1 to 6 carbon atoms, preferably a polymethylene group.

13. A process according to any one of claims 10 to 12, in which the solvent for the phosphorous-containing compound is selected from the group formed by tetrahydrofuran, dimethylsulphoxide, dichloromethane and water.

14. A process according to any one of claims 10 to 13, in which the phosphorous-containing compound with formula I employed is a compound in which m=2, q=1 and n=p=zero.

15. A process according to any one of claims 10 to 13, in which the phosphorous-containing compound with formula I employed is a compound in which n=2, q=1 and m=p=zero.